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# MSMR

Medical Surveillance Monthly Report

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*Data in the MSMR is provisional, based on reports and other sources of data available to the Medical Surveillance Activity. Notifiable conditions are reported by date of onset (or date of notification when date of onset is absent). Only cases submitted as confirmed are included.*

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## Case Reports

# Heat related injuries, July 1995

### **Cluster #1**

Five cases of heat exhaustion were reported during the first week of July at Fort Bragg, NC. The heat casualties occurred in soldiers who were at the "Green Ramp," attending advanced airborne school pre-jump training and preparation. Personnel were fully suited with rucksack, load bearing equipment, helmet, and parachute. Reportedly, there was no shade, and the casualties were positioned on a dark tarmac, near reflective aircraft. No Wet Bulb Globe Temperature (WBGT) reading was available, but the weather was sunny, hot, and humid.

### **Cluster #2**

Between July 10th and 18th, eighteen cases of heat related injuries occurred at Fort Sill, OK during a field training exercise in Category 5 weather conditions. On July 10th, fourteen soldiers were treated for heat exhaustion. Two days later a soldier was admitted with a rectal temperature of 101° F and a diagnosis of heat stroke. On July 13th, two more soldiers were treated for heat exhaustion. And on July 21st a recruit was admitted with altered mental status and a rectal temperature of 106.7° F. All 18 cases were from two batteries in their fifth week of training. The WBGT reached a high of 96° F taken at the MEDDAC.

### **Cluster #3**

Eleven soldiers taking part in a field training exercise were diagnosed with heat exhaustion during Category 5 weather conditions (WBGT 91.8° F at the MEDDAC) on July 11th at Fort Riley, KS.

### **Cluster #4**

Between the 16th and 19th of July 4 heat injury cases were treated at Fort Lee, Va. One case of heat exhaustion and one case of heat stroke (oral temp: 103.4° F) occurred in Army National Guardsmen on a two week active training duty. An additional case of heat exhaustion in a Army reservist and a case of heat stroke in a soldier during Advance Individual Training (Rectal temp: 101.8° F) also occurred during this time period. The WBGT varied from 87° to 93° F.

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One of the heat stroke victims had been given 24 hours quarters the previous day for mild heat exhaustion. He reportedly went to a sauna instead. The next day he was unresponsive to verbal stimuli and was evacuated to a local hospital. The other three soldiers had been working outside when they became symptomatic.

**Editorial Comment:** Despite well documented and effective techniques for preventing heat injuries, it remains a significant risk to soldiers (see *surveillance trends*, page 11). The highest incidence of heat casualties usually occur in the summer months. The summer of 1995 has been no exception. However, the rise in heat casualties should not be accepted as an inevitable consequence of the exceptionally hot weather. Rather, attention to those modifiable heat casualty risk factors.

Preventing heat illness depends on moderating

the rise in body temperature due to exercise and environmental heat load and maintaining hydration. Work-rest discipline, water and shade are successful in preventing heat casualties during moderate to heavy self-paced work in the heat. However, most heat casualties now occur during hard physical training with very high aerobic work rates among poorly acclimatized individuals. These individuals include new recruits, reservists, summer ROTC cadets, officer training schools and airborne and other military skill trainees. Prevention doctrine for these groups is not as well developed as it is for soldiers engaged in traditional military work.

Trainees often work at rates more than twice as high as the highest work rates used to determine traditional work-rest guidance. In addition, these individuals are often at low levels of acclimatization and aerobic fitness. They may have febrile reactions

*Continued on page 8*

## Heat Injury Prevention

CRITERIA		CONTROLS		
Heat Condition / Category	WBGT* Index (F°)	Water Intake Quart / Hour	Acclimatized** Work / Rest	Physical Activity for Soldiers Unacclimatized Soldiers and Trainees
1	78 - 81.9	At least 1/2	Continuous	
2	82 - 84.9	At least 1/2	50/10 minutes	Use discretion in planning heavy exercises
3	85 - 87.9	At least 1	45/15 minutes	Suspend strenuous exercise during first three weeks of training. Training activities may be continued on a reduced scale after the second week of training. Avoid activity in direct sun.
4	88 - 89.9	At least 1 1/2	30/30 minutes	Curtail strenuous exercise for all personnel with less than 12 weeks of hot weather training.
5	90 and up	More than 2	20/40 minutes	Physical training and strenuous exercise is suspended. Essential operational commitments not for training, where risk of heat casualties may be warranted, is excluded from suspension. Enforce water intake to minimize expected heat injuries.

\* MOPP gear or body armor adds 10°F to the WBGT index.

\*\* An acclimatized soldier is one who has worked in the given heat condition for 10 to 14 days.

**TABLE I. Cases of selected notifiable conditions, United States Army.\*  
July, 1995**

Reporting MTF/Post**	Total number of reports submitted July, 1995	Environmental Injuries			Viral Hepatitis			Malaria	Varicella		
		Active Duty		CO intox.	A	B	C		Active Duty	Active Duty	
		Heat	Cold						Cum. 1995	Cum. 1995	
<b>NORTH ATLANTIC HSSA</b>											
Walter Reed AMC	44	-	-	-	1	5	-	1	5	3	
Aberdeen Prov. Ground	0	-	-	-	1	-	-	-	-	-	
FT Belvoir, VA	0	1	-	-	-	-	-	-	-	-	
FT Drum, NY	10	4	21	-	-	-	-	1	13	1	
FT Eustis, VA	5	-	-	-	-	-	-	-	-	-	
FT Knox, KY	46	-	-	-	-	-	1	1	-	-	
FT Lee, VA	23	3	-	-	-	-	-	-	10	-	
FT Meade, MD	0	-	-	-	-	-	-	-	-	-	
USMA, West Point, NY	0	-	-	-	-	-	-	-	-	-	
<b>CENTRAL HSSA</b>											
Fitzsimons AMC	17	-	-	-	1	1	-	-	3	1	
FT Carson, CO	86	-	-	-	-	-	-	-	6	-	
FT Leonard Wood, MO	9	-	1	-	-	1	-	-	23	4	
FT Leavenworth, KS	6	-	-	-	-	-	-	-	-	-	
FT Riley, KS	28	11	1	-	-	-	-	-	-	-	
<b>SOUTH CENTRAL HSSA</b>											
Brooke AMC	7	-	-	-	2	-	-	1	-	-	
FT Hood, TX	0	5	-	-	-	1	-	-	26	1	
FT Polk, LA	8	5	-	-	-	-	-	-	-	-	
FT Sill, OK	68	18	-	3	-	-	-	1	-	-	
Panama	6	4	-	-	3	2	1	-	-	-	
<b>SOUTHEAST HSSA</b>											
Eisenhower AMC	13	-	-	-	-	1	1	-	1	-	
FT Benning, GA	8	11	14	-	-	-	-	1	1	-	
FT Bragg, NC	9	4	-	-	-	-	-	-	-	-	
FT Campbell, KY	229	-	-	-	1	-	1	-	2	-	
FT Jackson, SC	37	-	-	-	-	-	-	-	9	-	
FT McClellan, AL	2	-	-	-	-	-	-	-	-	-	
FT Rucker, AL	2	1	-	-	-	-	-	-	-	-	
FT Stewart, GA	0	-	-	-	-	-	-	-	-	-	
<b>SOUTHWEST HSSA</b>											
Wm Beaumont AMC	37	-	-	-	-	3	-	-	3	2	
FT Huachuca, AZ	0	-	-	-	-	-	-	-	-	-	
FT Irwin, CA	0	-	-	-	-	-	-	-	-	-	
<b>NORTHWEST HSSA</b>											
Madigan AMC	7	-	-	-	-	-	-	-	-	-	
FT Wainwright, AK	8	-	17	-	-	-	-	-	-	-	
<b>PACIFIC HSSA</b>											
Tripler AMC	34	1	-	-	-	2	-	5	-	-	
<b>OTHER LOCATIONS</b>											
Europe	35	-	4	2	-	2	-	-	6	1	
Korea	14	-	8	-	-	2	-	-	18	-	
<b>Total</b>	<b>798</b>	<b>68</b>	<b>66</b>	<b>5</b>	<b>9</b>	<b>20</b>	<b>4</b>	<b>11</b>	<b>126</b>	<b>13</b>	

\* Based on date of onset.

\*\* Reports are included from parent and daughter clinics. Not all sites reporting.

Date of Report: 7-Aug-95

**TABLE I. Cases of selected notifiable conditions, United States Army\* (continued)**  
**July, 1995**

Reporting MTF/Post**	Salmonellosis			Shigella			Campylobacteriosis			Tuberculosis	
	Active Duty	Other		Active Duty	Other		Active Duty	Other		Active Duty	Other
		Adult	Child		Adult	Child		Adult	Child		
Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995	Cum. 1995
<b>NORTH ATLANTIC HSSA</b>											
Walter Reed AMC	4	-	-	-	-	1	-	1	-	-	-
Aberdeen Prov. Ground	-	-	-	-	-	-	-	-	-	-	-
FT Belvoir, VA	-	1	2	-	1	1	-	2	1	-	-
FT Drum, NY	-	-	1	-	-	1	-	1	-	-	-
FT Eustis, VA	-	-	-	-	-	-	-	-	-	-	-
FT Knox, KY	1	-	-	-	-	-	-	-	1	-	-
FT Lee, VA	-	-	-	-	-	-	-	-	-	-	-
FT Meade, MD	-	-	-	-	-	-	-	-	-	-	-
USMA, West Point, NY	-	-	-	-	-	-	-	-	-	-	-
<b>CENTRAL HSSA</b>											
Fitzsimons AMC	-	-	-	-	-	-	-	-	-	-	-
FT Carson, CO	-	1	1	1	-	1	1	1	1	-	-
FT Leonard Wood, MO	-	1	1	-	-	-	-	-	-	-	-
FT Leavenworth, KS	-	-	-	-	-	-	-	-	-	-	-
FT Riley, KS	-	1	-	-	-	1	-	-	-	-	-
<b>SOUTH CENTRAL HSSA</b>											
Brooke AMC	-	-	-	-	-	-	-	-	-	-	-
FT Hood, TX	-	-	-	-	1	-	-	-	-	-	-
FT Polk, LA	-	-	-	-	-	-	-	-	-	-	-
FT Sill, OK	-	-	-	-	-	-	-	-	-	-	-
Panama	2	3	7	1	2	2	2	2	9	-	-
<b>SOUTHEAST HSSA</b>											
Eisenhower AMC	-	-	-	-	-	2	-	-	1	-	-
FT Benning, GA	-	-	-	-	-	-	-	-	-	-	-
FT Bragg, NC	1	1	2	-	-	-	2	-	1	-	-
FT Campbell, KY	-	-	-	2	-	2	-	-	-	-	-
FT Jackson, SC	-	-	1	-	-	3	-	-	-	2	-
FT McClellan, AL	-	-	-	-	-	3	-	-	-	-	-
FT Rucker, AL	-	-	-	-	-	-	-	-	-	-	-
FT Stewart, GA	-	-	-	-	-	-	-	-	-	-	-
<b>SOUTHWEST HSSA</b>											
Wm Beaumont AMC	-	2	3	-	-	-	-	-	-	-	-
FT Huachuca, AZ	-	-	-	-	-	-	-	-	-	-	-
FT Irwin, CA	-	-	-	-	-	-	-	-	-	-	-
<b>NORTHWEST HSSA</b>											
Madigan AMC	1	2	2	-	-	-	2	-	2	-	-
FT Wainwright, AK	-	-	-	-	-	-	1	-	-	-	-
<b>PACIFIC HSSA</b>											
Tripler AMC	-	-	2	-	-	-	8	-	1	-	-
<b>OTHER LOCATIONS</b>											
Europe	4	2	4	-	1	-	2	3	1	-	-
Korea	1	-	2	-	-	-	-	-	-	-	-
<b>Total</b>	<b>14</b>	<b>14</b>	<b>28</b>	<b>4</b>	<b>6</b>	<b>16</b>	<b>19</b>	<b>9</b>	<b>18</b>	<b>2</b>	<b>0</b>

\* Based on date of onset.

\*\* Reports are included from parent and daughter clinics. Not all sites reporting.

Date of Report: 7-Aug-95

**TABLE II. Cases of notifiable sexually transmitted diseases, United States Army.**  
**July, 1995**

Reporting MTF/Post*	Chlamydia		Gonorrhea		Herpes Simplex		Syphilis Prim/Sec		Syphilis Latent		Urethritis non-spec.		Other STDs**	
	Cur. Month	Cum. 1995	Cur. Month	Cum. 1995	Cur. Month	Cum. 1995	Cur. Month	Cum. 1995	Cur. Month	Cum. 1995	Cur. Month	Cum. 1995	Cur. Month	Cum. 1995
<b>NORTH ATLANTIC HSSA</b>														
Walter Reed AMC	8	31	13	22	9	21	-	2	2	2	1	4	-	9
Aberdeen Prov. Ground	-	22	-	12	-	-	-	-	-	-	-	6	-	-
FT Belvoir, VA	-	13	-	10	-	2	-	1	-	-	-	-	-	3
FT Drum, NY	9	52	3	24	-	8	-	-	-	-	2	14	-	-
FT Eustis, VA	2	10	1	7	-	-	-	-	-	-	-	-	-	-
FT Knox, KY	7	143	6	42	6	41	-	-	-	-	-	-	-	-
FT Lee, VA	15	31	2	27	-	1	-	1	-	-	-	1	-	-
FT Meade, MD	-	-	-	-	-	-	-	-	-	-	-	-	-	-
USMA, West Point, NY	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>CENTRAL HSSA</b>														
Fitzsimons AMC	6	31	-	7	-	2	-	-	-	1	-	-	1	2
FT Carson, CO	15	179	14	83	5	49	-	-	-	-	25	198	-	3
FT Leonard Wood, MO	1	32	2	24	-	4	-	2	-	-	2	26	-	2
FT Leavenworth, KS	1	2	-	-	1	3	-	-	-	-	-	-	-	-
FT Riley, KS	-	68	-	15	-	-	-	2	-	-	-	-	-	-
<b>SOUTH CENTRAL HSSA</b>														
Brooke AMC	-	1	-	-	-	-	-	-	-	-	-	-	-	-
FT Hood, TX	-	329	-	159	-	16	-	3	-	8	-	58	-	2
FT Polk, LA	3	12	-	9	-	2	-	-	-	-	-	-	-	-
FT Sill, OK	6	50	11	61	-	4	-	-	-	-	4	23	1	6
Panama	-	-	-	8	-	7	-	6	-	-	-	-	-	3
<b>SOUTHEAST HSSA</b>														
Eisenhower AMC	-	41	-	18	-	16	-	2	-	-	-	2	-	3
FT Benning, GA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Bragg, NC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Campbell, KY	75	201	-	46	1	17	-	1	-	-	34	119	-	-
FT Jackson, SC	14	109	3	31	2	23	-	-	-	1	1	1	3	5
FT McClellan, AL	3	24	-	10	-	2	-	-	-	-	-	-	-	-
FT Rucker, AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Stewart, GA	-	63	-	54	-	16	-	-	-	-	-	82	-	9
<b>SOUTHWEST HSSA</b>														
Wm Beaumont AMC	10	76	-	12	-	1	-	-	-	-	-	-	1	3
FT Huachuca, AZ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Irwin, CA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>NORTHWEST HSSA</b>														
Madigan AMC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	3	23	-	9	-	-	-	-	-	1	-	-	-	-
<b>PACIFIC HSSA</b>														
Tripler AMC	14	114	2	44	7	76	-	-	-	-	-	-	-	2
<b>OTHER LOCATIONS</b>														
Europe	6	42	-	4	-	1	-	-	-	-	-	-	2	5
Korea	-	19	-	11	-	3	-	-	-	1	-	-	-	4
<b>Total</b>	<b>198</b>	<b>1718</b>	<b>57</b>	<b>749</b>	<b>31</b>	<b>315</b>	<b>0</b>	<b>20</b>	<b>2</b>	<b>14</b>	<b>69</b>	<b>534</b>	<b>8</b>	<b>61</b>

\* Reports are included from parent and daughter clinics. Not all sites reporting.

Date of Report: 7-Aug-95

\*\* Other STDs: (a) Chancroid (b) Granuloma Inguinale (c) Lymphogranuloma Venereum (d) Syphilis unspes. (e) Syph, tertiary (f) Syph, congenital

**TABLE III. Reported heat and cold weather injuries, United States Army, Jan-Jul 1995\***

Reporting MTF/Post**	Heat Injuries				Cold Weather Injuries							
	Heat Exhaustion		Heat Stroke		Frostbite		Hypothermia		Immersion		Unspecified	
	M	F	M	F	M	F	M	F	M	F	M	F
<b>NORTH ATLANTIC HSSA</b>												
Walter Reed AMC	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Prov. Ground	-	-	-	-	-	-	-	-	-	-	-	-
FT Belvoir, VA	1	-	-	-	-	-	-	-	-	-	-	-
FT Drum, NY	3	-	1	-	13	2	-	-	5	1	-	-
FT Eustis, VA	-	-	-	-	-	-	-	-	-	-	-	-
FT Knox, KY	-	-	-	-	-	-	-	-	-	-	-	-
FT Lee, VA	-	2	1	-	-	-	-	-	-	-	-	-
FT Meade, MD	-	-	-	-	-	-	-	-	-	-	-	-
USMA, West Point, NY	-	-	-	-	-	-	-	-	-	-	-	-
<b>CENTRAL HSSA</b>												
Fitzsimons AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Carson, CO	-	-	-	-	-	-	-	-	-	-	-	-
FT Leonard Wood, MO	-	-	-	-	-	1	-	-	-	-	-	-
FT Leavenworth, KS	-	-	-	-	-	-	-	-	-	-	-	-
FT Riley, KS	7	4	-	-	-	-	1	-	-	-	-	-
<b>SOUTH CENTRAL HSSA</b>												
Brooke AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Hood, TX	4	1	-	-	-	-	-	-	-	-	-	-
FT Polk, LA	1	-	4	-	-	-	-	-	-	-	-	-
FT Sill, OK	15	1	1	1	-	-	-	-	-	-	-	-
Panama	4	-	-	-	-	-	-	-	-	-	-	-
<b>SOUTHEAST HSSA</b>												
Eisenhower AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Benning, GA	4	2	5	-	3	-	7	-	4	-	-	-
FT Bragg, NC	2	-	2	-	-	-	-	-	-	-	-	-
FT Campbell, KY	-	-	-	-	-	-	-	-	-	-	-	-
FT Jackson, SC	-	-	-	-	-	-	-	-	-	-	-	-
FT McClellan, AL	-	-	-	-	-	-	-	-	-	-	-	-
FT Rucker, AL	-	1	-	-	-	-	-	-	-	-	-	-
FT Stewart, GA	-	-	-	-	-	-	-	-	-	-	-	-
<b>SOUTHWEST HSSA</b>												
Wm Beaumont AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Huachuca, AZ	-	-	-	-	-	-	-	-	-	-	-	-
FT Irwin, CA	-	-	-	-	-	-	-	-	-	-	-	-
<b>NORTHWEST HSSA</b>												
Madigan AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	-	-	-	-	10	7	-	-	-	-	-	-
<b>PACIFIC HSSA</b>												
Tripler AMC	-	-	1	-	-	-	-	-	-	-	-	-
<b>OTHER LOCATIONS</b>												
Europe	-	-	-	-	-	-	-	-	1	2	1	-
Korea	-	-	-	-	3	-	-	-	-	-	-	-
<b>Total</b>	<b>41</b>	<b>11</b>	<b>15</b>	<b>1</b>	<b>29</b>	<b>10</b>	<b>8</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>2</b>	<b>1</b>

\* Army active duty cases only.

\*\* Reports are included from parent and daughter clinics. Not all sites reporting.

*Continued from page 3*

due to immunization or infection and be experiencing sleep loss and psychological stress. In some of these programs, individuals need to compete to succeed and will ignore early symptoms of illness in order to achieve a high standard of performance. Preventing heat illness in those individuals requires work-rest guidance appropriate for their high aerobic work rates, careful monitoring for fever and intercurrent illness, supervised acclimatization, and maintenance of hydration and nutrition.

Heat illnesses themselves remain a complex and poorly understood group of conditions. Our lack of knowledge complicates the process of definition, diagnosis and classification. Heat illnesses are classically defined as: heat exhaustion, heat stroke and heat cramps (not discussed). Now added to this list are: exertional rhabdomyolysis and exertional hyponatremia.

Heat exhaustion is the most common of the heat illnesses and is considered to be the expression of insufficient cardiac output to meet the demands of thermoregulation, exercising muscle and viscera. Dehydration is an important contributor to the pathophysiology of heat exhaustion. An important hallmark of heat exhaustion is rapid clinical recovery with cooling, rest and rehydration.

Heat stroke is a sporadic multisystem disease exhibiting manifest injury to the brain, liver, muscle and kidneys. Its etiology, beyond the requirement for heat exposure, and pathophysiology is unknown but evidence is accumulating that some etiologic factor in addition to heat exposure is required.

Exertional rhabdomyolysis is an exertional heat illness manifested by marked myoglobin release from muscle and myoglobinuric renal failure. Its pathophysiology is unknown; some evidence points to an underlying myopathy in some cases. Its relationship to the rhabdomyolysis found in exertional heat stroke is unknown.

Exercise-related hyponatremia is a form of water intoxication due to excessive water drinking and water retention in the heat which seems to be due to the simultaneous triggering of thirst and vasopressin secretion. Since it would not occur in the absence of water consumption, it may in fact be a relatively recent arrival on the military heat illness scene, uncovered by our successful efforts to foster water drinking during exercise.

Heat illnesses present clinicians and preventive medicine officers with a number of important and difficult issues. For example, although we present heat exhaustion and heat stroke as two discrete entities in fact there are a large number of heat illness patients that defy easy classification. These are patients who although well or minimally ill after heat exposure show evidence of significant muscle and liver injury. Indeed, many of these patients are recognized only because they are followed using a heat illness protocol. In the absence of directed laboratory investigations, they would be considered simple heat exhaustion and returned to usual activity after a period of rest and rehydration. Do they have heat stroke or heat exhaustion? Do they require a different period of recovery than individuals without enzyme changes? We do not know.

There is good reason to hope our understanding of exertional heat illness will improve over the next few years. An ongoing study at the Parris Island Marine Recruit Depot involving USARIEM, USUHS and Navy scientists is on the threshold of significant insights into the pathogenesis of exertional heat illness. In the meantime, Table 1 (page 8) provides one scheme for the classification and management of heat illness appropriate for our current state of knowledge.

*Editorial comment submitted by LTC RE Burr, MC,  
Medical Advisor, US Army Research Institute of Environmental Medicine.*

**Table 1. Guidelines for Classification and Disposition of Heat Injuries**

<b>Diagnosis</b>	<b>Signs and Symptoms</b>	<b>Disposition</b>
<b>Heat Exhaustion</b>	occurs during exercise headache, GI symptoms, exhaustion, collapse, syncope rapid recovery with rest and rehydration peak CK < 1000 no abnormal LFTs no myoglobinuria	1) rest / rehydration: 24 - 72 hours 2) longer until resolution of predisposing factor: sunburn fever, etc.
<b>Exertional Heat Injury</b>	occurs during exercise headache, GI symptoms, exhaustion, collapse, syncope rapid recovery with rest and rehydration peak CK > 1000 creatinine: day 2 > day 1 LFTs < 3 x upper limits of normal no encephalopathy or coagulopathy	1) rest / rehydration 2) supervised return to duty after complete resolution of abnormal labs 3) reacclimatize
<b>Exertional Heat Stroke</b>	occurs during exercise, often early may be critically ill from onset encephalopathy or coagulopathy common CK > 5000 peak creatinine > 2.0 LFTs > 3 x upper limits of normal	1) consider medical board 2) supervised return to duty 3_ PT / work in heat profile for 1 year
<b>Exertional Rhabdomyolysis</b>	muscle pain after exertion CPK >> 5000 myoglobinuria peak creatinine > 2.0 no encephalopathy or coagulopathy LFTs < 3 x upper limits of normal	1) consider medical board
<b>Exercise-Related Hyponatremia</b>	gradual onset symptoms late in the day marked thirst hyponatremia no significant change in LFTs, renal function, CK, coagulation	1) evaluate for all causes of hyponatremia 2) supervised return to duty after clinical recovery 3) reacclimatize
<b>Dehydration</b>	after heat exposure "parade" syncope headache, nausea, fatigue, constipation heat intolerance mild orthostasis common mild hemoconcentration concentrated urine	1) rest / rehydrate 24 hours 2) supervision of water intake or IV fluids

**TABLE IV. Cases of hospitalized heat injuries, Active Duty Army.\***

<b>Reporting MTF/Post**</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>Total</b>
<b>NORTH ATLANTIC HSSA</b>						
Walter Reed AMC	6	5	3	1	-	15
Aberdeen Prov. Ground	-	-	-	-	-	0
FT Belvoir, VA	1	-	2	-	1	4
FT Drum, NY	-	-	-	-	-	0
FT Eustis, VA	3	2	1	1	1	8
FT Knox, KY	4	30	1	2	2	39
FT Lee, VA	9	2	2	3	-	16
FT Meade, MD	1	10	1	-	-	12
USMA, West Point, NY	2	1	-	-	-	3
<b>CENTRAL HSSA</b>						
Fitzsimons AMC	2	-	-	-	-	2
FT Carson, CO	1	1	-	-	-	2
FT Leonard Wood, MO	5	8	-	6	3	22
FT Leavenworth, KS	-	-	-	-	-	0
FT Riley, KS	7	-	-	-	1	8
<b>SOUTH CENTRAL HSSA</b>						
Brooke AMC	4	4	1	6	1	16
FT Hood, TX	8	2	4	7	2	23
FT Polk, LA	11	6	7	3	2	29
FT Sill, OK	15	5	7	10	9	46
Panama	32	49	23	15	19	138
<b>SOUTHEAST HSSA</b>						
Eisenhower AMC	8	3	4	-	2	17
FT Benning, GA	54	32	28	22	25	161
FT Bragg, NC	23	54	17	16	12	122
FT Campbell, KY	15	11	7	12	5	50
FT Jackson, SC	14	20	6	3	6	49
FT McClellan, AL	3	1	1	-	6	11
FT Rucker, AL	2	2	-	2	6	12
FT Stewart, GA	4	139	32	24	3	202
<b>SOUTHWEST HSSA</b>						
Wm Beaumont AMC	8	3	9	1	3	24
FT Huachuca, AZ	-	-	-	-	-	0
FT Irwin, CA	6	19	15	1	11	52
<b>NORTHWEST HSSA</b>						
Madigan AMC	4	1	-	1	2	8
FT Wainwright, AK	1	-	-	1	-	2
<b>PACIFIC HSSA</b>						
Tripler AMC	4	-	-	1	8	13
<b>OTHER LOCATIONS</b>						
Europe	13	4	7	2	4	30
Korea	1	4	4	1	6	16
Other MTF	25	21	1	10	2	59
	<b>296</b>	<b>439</b>	<b>183</b>	<b>151</b>	<b>142</b>	<b>1211</b>

\* Based on date of disposition.

\*\* Includes admissions from parent and daughter MTFs.

Date of Report: 7-Aug-95

## Respiratory Disease Outbreak Among Trainees at Ft Jackson

During the week of 10 July 1995, the Preventive Medicine Service at Fort Jackson was alerted to another increase in trainee admissions for acute respiratory disease (ARD) (see MSMR Vol.01 No. 03 for description of first outbreak). Between 2 and 15 July, 139 soldiers were admitted to Moncrief Army Community Hospital with ARD. The ARD rates during those two weeks were 0.50% and 0.98% for the post as a whole. Fifty nine, or 42% of the admissions, were from two battalions, with battalion-specific ARD rates of 0.92% and 0.54% for the first week, and 2.36% and 1.54 % the second week (see figure 1 on page 12).

Clinical presentation was fever, sore throat, body aches, and congestion. Throat cultures from the two battalions were negative for group A beta hemolytic Streptococcus. The average hospital stay was 48-72 hours without reported complications.

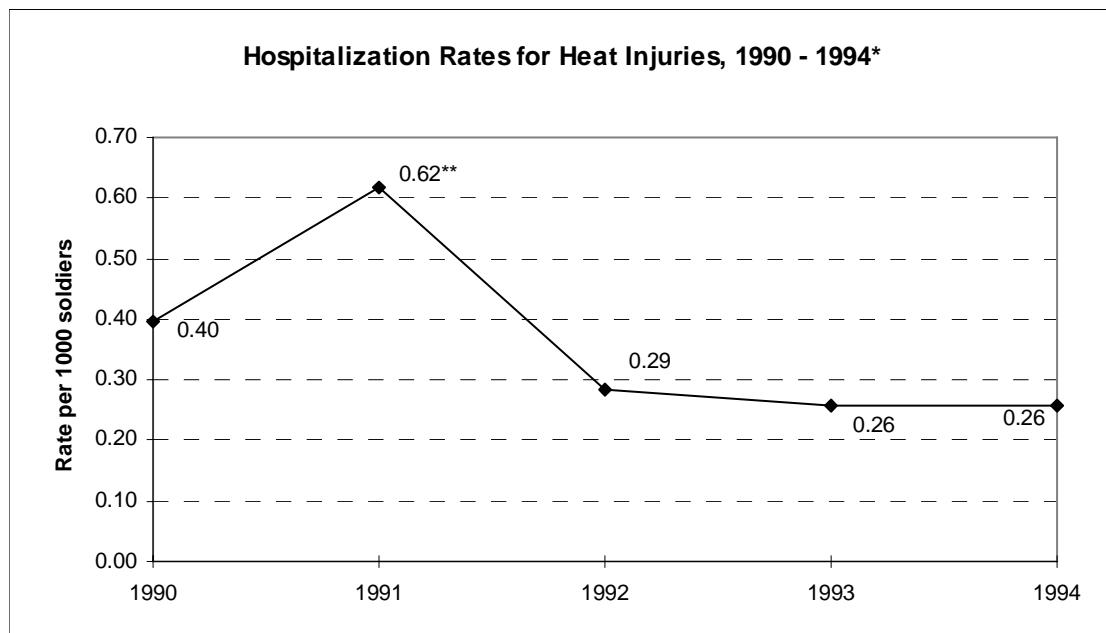
An investigation revealed that adenovirus vac-

cine administration had inadvertently been halted during the time personnel forming these units arrived. Although the installation ARD epidemic threshold (ARD admissions > 1.5%) was not surpassed, nasal and pharyngeal specimens from 4 acutely ill soldiers were sent to Eisenhower Army Medical Center for viral isolation per MEDCOM policy on ARD outbreak response. Specimens from all four soldiers grew Coxsackie virus A21 as the etiologic agent.

*Submitted by EM Barraza, MAJ, MC, Chief, Preventive Medicine Service, Fort Jackson, SC 20207-5720; DSN 734-5200/5157, commercial (803) 751-5200.*

**Editorial Comment:** Summer season acute respiratory disease outbreaks are relatively uncommon in trainee settings. Initial laboratory  
*Continued on page 12*

### Surveillance Trends



\* Active Duty Army only. (See table IV on page 10 for details)

\*\* Includes 128 cases at Fort Stewart in July, 1991

*Continued from page 11*

results suggest that this self limited outbreak at Fort Jackson was etiologically linked to coxsackie A21.

In 1958, a new human virus ("the Coe virus"), subsequently identified as coxsackie A21, was isolated from throat specimens of soldiers with mild acute respiratory illnesses. Since then, outbreaks of respiratory illness have been associated with coxsackie A21 in both military trainee and "seasoned" troop populations; and efficient airborne transmission of coxsackie A21 in barracks settings has been documented in controlled studies. However, outbreaks of coxsackie A21 respiratory illness are unlikely to be recognized since special laboratory tests are necessary for etiologic diagnosis, the clinical course is generally mild and self limited, and there are no pathognomonic clinical features.

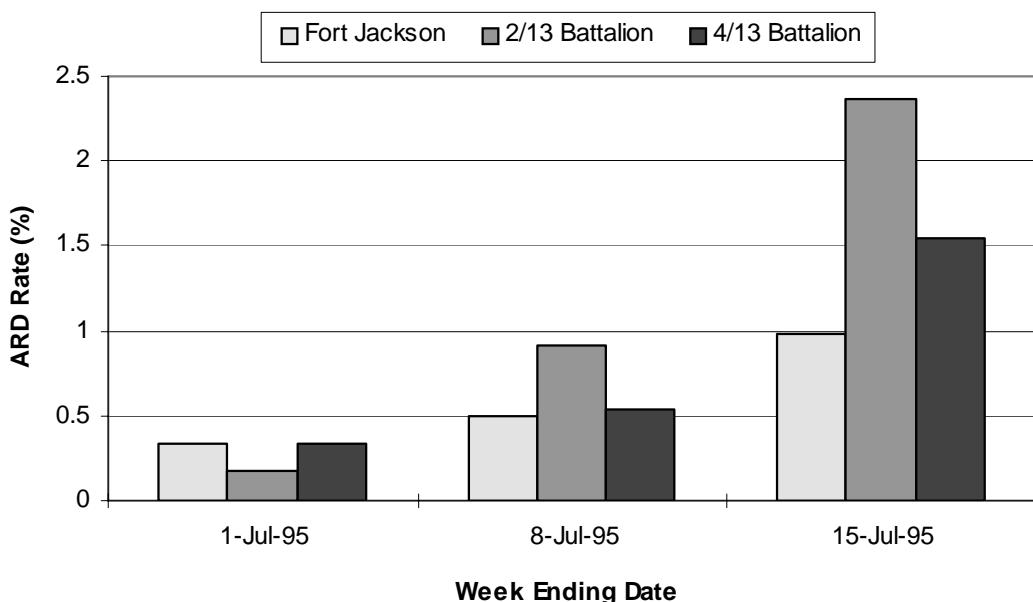
A typical presentation includes coryza, headache, sore throat, chills, myalgias, and low grade fever. As with other enteroviruses, coxsackie A21

outbreaks occur most frequently in late summer and fall. There are no specific preventive or curative interventions indicated for coxsackie A21 acute respiratory illness.

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- 1) Lennette, EH, Fox, VL, Schmidt, NJ, Culver, JO. The Coe virus: An apparently new virus recovered from patients with mild respiratory disease. Am J Hygiene. 1958, 68, 272-87
- 2) Johnson, KM, Bloom, HH, Mufdson, MA, Chanock, RM. Acute respiratory disease associated with coxsackie A-21 virus infection: I. Incidence in military personnel: Observations in a recruit population. JAMA, 1962, 179(2), 112-9.
- 3) Johnson, KM, Bloom, HH, Mufdson, MA, Chanock, RM. Acute respiratory disease associated with coxsackie A-21 virus infection: I. Incidence in military personnel: Observations in a non-recruit population. JAMA 1962, 179(2), 120-5.
- 4) Couch, RB, Douglas, RG, Lindgren, KM, Gerone, PJ, Knight, V. Airborne transmission of respiratory infection with coxsackie A type 21. Am. J. Epi, 1968, 91(1), 78-86.

**Figure 2. ARD rates for weeks 01July95 - 15July95**



ARD Surveillance Update

<i>Legend</i>	
—	ARD Rate = (ARD cases / Trainees) * 100
- - -	SASI* = ARD Rate * Strep Rate**

FT Benning

Ft Jackson

Ft Knox

Ft Leonard  
Wood

Ft McClellan

Ft Sill

**Table IV. ARD surveillance rates, submitted by Army TRADOC posts**

\* Strep/ARD Surveillance Index (SASI)

\*\*Strep Rate = (GABHS(+)) / Cultures) \* 100

Note: SASI has proven to be a reliable predictor of serious strep-related morbidity, especially acute rheumatic fever.

## Lightning Strike, Fort Jackson, SC

On 6 July 1995, 14 soldiers from two companies were struck by lightning while on an end-of-cycle Basic Combat Training (BCT) Field Training Exercise. The soldiers reportedly sought cover during an electrical storm in two-man shelter-halves on low ground but near trees as a clearing was unavailable. They were in various positions in their tents when the lightning strike occurred.

The two most seriously injured casualties were

lying prone in their tent closest to a pine tree which was directly struck by lightning. One of the soldiers was fatally wounded while the other received on-site basic life support and recovered in the hospital with minor burns to the right knee, abdomen and left shoulder. Nine additional soldiers were admitted to the hospital for treatment or observation. Two soldiers were treated and released the same day. All the patients have subsequently been released.

### Safety Measures During Electrical Storms

- Cease all outside training.
- Move personnel into a building if possible.
- If no building is available, move personnel into dense woods; a low area, ditch or ravine; or the foot of a hill or cliff.
- Avoid hilltops, lone trees, flagpoles, fences, overhead wires, tents and small unprotected buildings in the open, and metallic objects such as artillery pieces and open or canvas top vehicles.
- Keep personnel away from fences, electrical wiring, vehicles or other possible conductors of electricity
- Move away from areas containing TV antennas, relay antennas, or vehicles with whip antennas.
- Move a safe distance away from metal machinery, approximately 100 feet.
- Do not use radios or carry radios with antennas extended.
- When marching in formation, increase the minimum distance and interval to twice that normally maintained.
- Do not group together under a tree; do not huddle together if caught in an open area.
- When indoors, stay away from telephones, electrical wiring, fireplaces, stoves, showers, bathtubs, sinks, water pipes, and other possible conductors of electricity.
- Do not use personal plug-in appliances such as hair dryers, toothbrushes, or razors.
- Do not handle flammable liquids in open containers.



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